FOR EDEXCEL

GCE Examinations
Advanced Subsidiary

Core Mathematics C1

Paper H

MARKING GUIDE

This guide is intended to be as helpful as possible to teachers by providing concise solutions and indicating how marks could be awarded. There are obviously alternative methods that would also gain full marks.

Method marks (M) are awarded for knowing and using a method.

Accuracy marks (A) can only be awarded when a correct method has been used.

(B) marks are independent of method marks.

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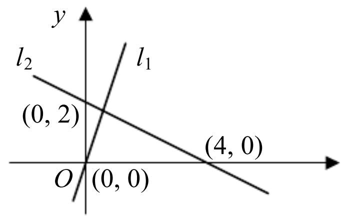
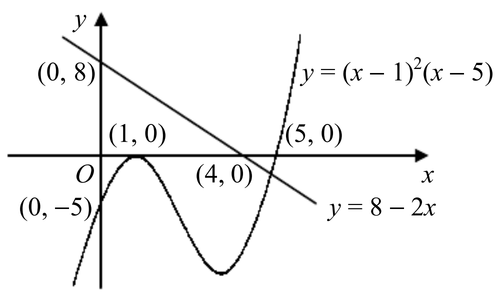
C1 Paper H – Marking Guide

1.		AP: $a = 7$, $l = 94$	B1	
		$S_{30} = \frac{30}{2}(7 + 94) = 15 \times 101 = 1515$	M1 A1	**(3)**
2.	*(a)*	$= (x + 3)^2 - 9 + 7$	M1	
		$= (x + 3)^2 - 2$	A2	
	(b)	$(-3, -2)$	B1	**(4)**
3.	*(a)*		B2 B1	
	(b)	$l_1 \Rightarrow 6x - 2y = 0$		
		l_2: $x + 2y - 4 = 0$		
		adding $7x - 4 = 0$, $x = \frac{4}{7}$	M1 A1	
		$\therefore$ intersect at $(\frac{4}{7}, \frac{12}{7})$	A1	**(6)**
4.		$5x + y = 7 \Rightarrow y = 7 - 5x$	M1	
		sub. into $3x^2 + y^2 = 21$		
		$3x^2 + (7 - 5x)^2 = 21$	M1	
		$2x^2 - 5x + 2 = 0$	A1	
		$(2x - 1)(x - 2) = 0$	M1	
		$x = \frac{1}{2}, 2$	A1	
		$\therefore (\frac{1}{2}, \frac{9}{2})$ and $(2, -3)$	M1 A1	**(7)**
5.	*(a)*		B3 B2	
	(b)	the graphs intersect at exactly one point $\therefore$ one solution	B1	
	(c)	$n = 4$	B1	**(7)**
6.	*(a)*	$\frac{dy}{dx} = 2x + 2$	M1 A1	
		grad of tangent = 2	A1	
		grad of normal = $\frac{-1}{2} = -\frac{1}{2}$	M1	
		$\therefore y = -\frac{1}{2}x$	A1	
	(b)	$x^2 + 2x = -\frac{1}{2}x$		
		$2x^2 + 5x = 0$, $x(2x + 5) = 0$	M1	
		$x = 0$ (at O), $-\frac{5}{2}$	A1	
		$\therefore (-\frac{5}{2}, \frac{5}{4})$	A1	**(8)**

7.	*(a)*	$\frac{dy}{dx} = \frac{1}{2}x^{-\frac{1}{2}} + 2x^{-\frac{3}{2}}$	M1 A2	
	(b)	$\frac{d^2y}{dx^2} = -\frac{1}{4}x^{-\frac{3}{2}} - 3x^{-\frac{5}{2}}$	M1 A1	
	(c)	LHS $= 4x^2(-\frac{1}{4}x^{-\frac{3}{2}} - 3x^{-\frac{5}{2}}) + 4x(\frac{1}{2}x^{-\frac{1}{2}} + 2x^{-\frac{3}{2}}) - (x^{\frac{1}{2}} - 4x^{-\frac{1}{2}})$		
		$= -x^{\frac{1}{2}} - 12x^{-\frac{1}{2}} + 2x^{\frac{1}{2}} + 8x^{-\frac{1}{2}} - x^{\frac{1}{2}} + 4x^{-\frac{1}{2}}$	M1 A1	
		$= 0$	A1	**(8)**
8.	*(a)*	$S_n = 1 + 2 + 3 + \ldots + n$	B1	
		$S_n = n + (n-1) + (n-2) + \ldots + 1$	M1	
		adding, $2S_n = n(n+1)$	M1	
		$S_n = \frac{1}{2}n(n+1)$	A1	
	(b)	*(i)* $= S_{200} - S_{99}$	M1	
		$= \frac{1}{2} \times 200 \times 201 - \frac{1}{2} \times 99 \times 100$	M1	
		$= 20\,100 - 4950 = 15\,150$	A1	
		(ii) $= 3 \times 15\,150 = 45\,450$	M1 A1	**(9)**
9.	*(a)*	*(i)* $= 16 - 24\sqrt{2} + 18 = 34 - 24\sqrt{2}$	M1 A1	
		(ii) $= \frac{1}{2+\sqrt{2}} \times \frac{2-\sqrt{2}}{2-\sqrt{2}}$	M1	
		$= \frac{2-\sqrt{2}}{4-2} = 1 - \frac{1}{2}\sqrt{2}$	M1 A1	
	(b)	*(i)* $y^2 - 9y + 8 = 0$		
		$(y-1)(y-8) = 0$	M1	
		$y = 1, 8$	A1	
		(ii) let $y = x^{\frac{3}{2}} \Rightarrow y^2 + 8 = 9y$		
		$\therefore\ x^{\frac{3}{2}} = 1, 8$	B1	
		$x = 1$ or $(\sqrt[3]{8})^2$	M1	
		$x = 1$ or 4	A1	**(10)**
10.	*(a)*	$f(x) = \int (3x^{\frac{1}{2}} - 4x^{-\frac{1}{2}})\ dx$		
		$f(x) = 2x^{\frac{3}{2}} - 8x^{\frac{1}{2}} + c$	M1 A2	
		$(0, 0)\ \therefore c = 0$	M1	
		$f(x) = 2x^{\frac{3}{2}} - 8x^{\frac{1}{2}}$	A1	
	(b)	$2x^{\frac{3}{2}} - 8x^{\frac{1}{2}} = 0$		
		$2x^{\frac{1}{2}}(x-4) = 0$	M1	
		$x = 0$ (at O), $4\ \therefore A\ (4, 0)$	A1	
	(c)	$x = 2\ \therefore y = 2(2\sqrt{2}) - 8(\sqrt{2}) = -4\sqrt{2}$	M1 A1	
		grad $= 3\sqrt{2} - \frac{4}{\sqrt{2}} = 3\sqrt{2} - 2\sqrt{2} = \sqrt{2}$	M1 A1	
		$\therefore\ y + 4\sqrt{2} = \sqrt{2}(x-2)$	M1	
		$y = \sqrt{2}x - 6\sqrt{2}$	A1	**(13)**
			Total	**(75)**

Performance Record – C1 Paper H

Question no.	1	2	3	4	5	6	7	8	9	10	Total
Topic(s)	AP	compl. square	straight lines	simul. eqn	curve sketch	diff., normal	diff.	AP	surds, quad.	integr., tangent	
Marks	3	4	6	7	7	8	8	9	10	13	75
Student											